MESSRS. JARROLD AND SONS have published a "Handbook to the Rivers and Broads of Norfolk and Suffolk," by Mr. G. Christopher Davies, who seems to be thoroughly acquainted with every winding and nook of these curious features of East Anglian scenery. It seems a really charming and easily accessible place for a quiet and refreshing holiday, gives ample scope for the collecting naturalist and the fisher who loves a well-filled basket.

FROM the *Report* of the Rugby School Natural History Society for 1881, we see that the work has been fairly sustained. The *Report* contains few papers by the members of the Society themselves, considerable space being given to an abstract of four instructive lectures on the Natural History of Islands, by Mr. A. R. Wallace. Appended to Mr. Seabroke's usual observatory report, is a Syllabus of work with the instruments in the Temple Observatory, which shows that very thorough instruction in practical astronomical work is available for the Rugby boys.

THE scarcity of water is excessive in France and Germany; the level of the Seine has never been so low since 1734. The quantity of rain which fell this winter has not reached half the usual quantity. The engineers of the City of Paris and the Government are trying to find protection against such a scarcity, which will turn to a calamity if rainy weather does not set in shortly.

IN February of last year an account was given in this journal of Baeyer's method for preparing artificial indigo (NATURE, vol. xxiii. p. 390). The fifth step in the process, as there described, consisted in the preparation of *orthonitrophenylpropiolic acid:* in a patent recently obtained by the "Badische Anilin und Sodafabrik," bye-products obtained from this acid are employed as sources of indigo. By the action of alkaline-reducing agents, *e.g.* ammonium sulphide, on the ethyl salt of this acid, *ethylic indogenate* is obtained; thus, $C_8H_4 . NO_2(CO_2 . C_2H_5) + 2H_2 = C_8H_6NO(CO_2 . C_2H_5) + H_2O$. *Indogenic acid* (melting at 122° to 123°) is obtained by saponifying this ethylic salt; the acid easily gives off carbonic anhydride, either by boiling in aqueous solutions or by heating to its melting-point, with the production of *indogen*, C_8H_7NO, an oily liquid, showing yellow-green fluorescence. Any of these substances—ethylic indogenate, indogenic acid, or indogen—readily yields indigo blue by the action of dilute acids or alkalies, when freely exposed to the air, without heating.

THE recent study of the Rhone glacier by M. Gosset is probably the most detailed and exact that has ever been made of a glacier. According to Prof. Rutimeyer (who has recently written on the results of these researches) a precise topographical knowledge of the glacier is supplied; and the scale of representation (1 : 5000) allows of following all the details of form. There are also exact data as to the glacier's movements. Four rows of stones of different colours were placed, in 1874, on its surface, and their position has been precisely noted from time to time. These observations prove that the glacier advances much more rapidly in the upper part (600 to 680 m. since 1874) than near the extremity, where the progress has only been 150 m. below the cascade of ice; also that the ablation, *nil* in the higher parts, is very great in the lower; and that the difference in the progress of the central and the lateral parts of the glacier is much greater in the first part.

M. MONTIGNY published, a short time ago, some interesting observations on the effects of lightning on trees placed near a telegraph wire. A more extended examination of the road from Rochefort to Dinant has enabled him to mature his conclusions, and he now affirms (*Bull. Belg. Akad.*, 1) that "in the section of road beyond Rochefort, nine kilometres in extent, where one notices poplars that have been struck by lightning near a telegraph wire, the fulminant fluid has scarcely produced its effects, except in places where the provocative action of the wire is favoured by the influence exerted on it by a considerable group of lofty trees; this action is especially favoured in places where the road traverses woods on an elevation, but the differences of height seem to have less powerful influence than the surrounding and neighbourhood of wood." This conclusion agrees with what Arago observed as to the objects and places which lightning strikes by preference.

THE additions to the Zoological Society's Gardens during the past week include a Malbrouck Monkey (*Cercopithecus cynosurus*) from East Africa, presented by Mr. Robert Mills; a Vervet Monkey (*Cercopithecus lalandii*) from South Africa, presented by Mr. T. W. Gourlay; a Macaque Monkey (*Macacus cynomolgus* ♀) from India, presented by Mr. E. W. Hills; a Black-backed Jackal (*Canis mesomelas*) from South Africa, presented by Capt. E. Jones; a Canada Goose (*Bernicla canadensis*) from North America, presented by Mr. George Edson; a Saker Falcon (*Falco sacer* ♂), captured in the Red Sea, presented by Mr. Battersby; a Chimpanzee (*Anthropopithecus troglodytes* ♀), an Angolan Vulture (*Gypohierax angolensis*), a Mueller's Parrakeet (*Tanygnathus muelleri*), a Ludio Monkey (*Cercopithecus ludio* ♂), a Blackish Sternothere (*Sternothærus subniger*) from West Africa, an Opossum (*Didelphys*, sp. inc.), a Kinkajou (*Cercoleptes caudivolvulus*), a Great-billed Rhea (*Rhea macrorhyncha*) from South America, four Meyer's Parrots (*Pæocephalus meyeri*) from East Africa, a Magellanic Goose (*Bernicla magellanica*) from Patagonia, a Brazilian Tree Porcupine (*Synetheres prehensilis*) from Brazil, a Western Black Cockatoo (*Calyptorhynchus naso* ♂) from Western Australia, two Indian River Snakes (*Tropidonotus quincunciatus*), an Indian Cobra (*Naia tripudians*) from India, purchased; a Crested Screamer (*Chauna chavaria*) from South America, received on approval; two Golden-headed Parrakeets (*Brotogerys tui*) from South America, received in exchange; three Chilian Pintails (*Dafila spinicauda*), hatched in the Gardens.

OUR ASTRONOMICAL COLUMN

COMET 1882 *a*.—Observations by Prof. Tacchini at the Observatory of the Collegio Romano, Rome, on April 6, gave the following place of this comet:—

	M.T. at Rome.	R.A.	Decl.
	h. m. s.	h. m. s.	° ′ ″
April 6 at	14 38 7 ...	18 29 33·62 ...	+44 54 34·9

From this position, which was kindly communicated by Prof. Tacchini, and those obtained at Harvard College, U.S., on March 19, and at Vienna on March 28, the following elements result:—

Perihelion passage 1882, June 9·96974 G.M.T.

Longitude of perihelion	54 25 17·2	From Ap. Eq.
,, ascending node ...	204 37 42·1	April 0.
Inclination	73 35 39·4	
Log. perihelion distance	8·748238	

Motion—direct.

The co-ordinate constants to this parabola are (App. Eq. May 0):—

$$x = r\,[9{\cdot}96219] \sin (v + 127^\circ\ 10'3)$$
$$y = r\,[9{\cdot}86101] \sin (v + 61\ 33{\cdot}8)$$
$$z = r\,[9{\cdot}90055] \sin (v + 197\ 45{\cdot}4).$$

Hence with the X, Y, Z of the *Nautical Almanac* the following positions are found:—

At Greenwich midnight

	R.A.	Decl.	Log. distance from Earth.	Log. distance from Sun.
	h. m. s.	° ′		
April 20 ...	19 15 41 ...	+57 27·7 ...	0·0528 ...	0·1610
22 ...	19 25 49 ...	59 31·0 ...	0·0414 ...	0·1488
24 ...	19 37 33 ...	61 36·7 ...	0·0303 ...	0·1362
26 ...	19 51 22 ...	63 43·7 ...	0·0196 ...	0·1230
28 ...	20 7 51 ...	65 50·4 ...	0·0093 ...	0·1091
30 ...	20 27 49 ...	+67 54·8 ...	9·9995 ...	0·0946

Mr. J. T. Barber of Spondon, Derby, informs us that on April 6, the night of the above observation at the Collegio Romano, he considered that the total impression given by the comet's light was about equal to that of a star of the seventh magnitude. If we take the theoretical intensity of light (represented by the reciprocal of the product of the squares of the distances of the comet from the earth and sun) as *unity*, we find the intensity on the following dates :—

May 12 ...	7·1	May 20 ...	11·8	May 28	24·2
16 ...	9·1	24 ...	16·0	June 10 (perihelion)	1590·0

THE SOLAR ECLIPSE OF MAY 16.—The *Nautical Almanac* gives the following particulars of this phenomenon, which is seen as a small partial eclipse in these islands :—

	Begins.	Greatest phase.	Ends.	Magnitude (sun's diameter=1).	Angle from N. point of first contact. *Direct.*
	h. m.	h. m.	h. m.		°
Greenwich	18 10·5	18 46·0	19 23·0	0·186	158
Cambridge	18 13·2	18 47·7	19 23·7	0·175	159
Oxford ...	18 7·2	18 41·2	19 16·7	0·173	160
Liverpool	18 6·2	18 36·7	19 8·4	0·139	163
Edinburgh	18 13·2	18 40·2	19 8·1	0·105	167
Dublin ...	17 55·2	18 22·9	18 51·5	0·116	166

If we apply the Littröu-Woolhouse method of distributing the times approximately over this country we have the following equations :—

G.M.T. of	h. m.
Beginning	18 6·12+[0·4696] L−[9·2403] M.
Greatest phase	18 43·58+[0·2142] L+[8·5528] M.
Ending	19 22·58+[9·4197] L+[9·4134] M.

The magnitude is given by 0·205−[8·115] L+[7·250] M.

Here the latitude of the place for which the Greenwich times are required is put $=50°+L$ (and expressed in degrees and decimals), and M is the longitude from Greenwich, taken positively towards the east, and expressed in minutes and decimals of time.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE

OXFORD.—Prof. Odling will conclude this term his course on the Atomic Theory; Mr. Fisher will lecture on Inorganic Chemistry; and Mr. F. J. Brown will form a class for practical instruction in organic chemistry.

Prof. Lawson will lecture at the Botanic Gardens on the General Morphology of Plants, and will continue his course on the Elements of Systematic Botany.

Mr. Yule will give a course of demonstrations at the Magdalen College Laboratory, on the Physiology of the Nervous System.

A Postmastership in Physical Science is offered by Merton College in June. The examination will be held in common with Magdalen and Jesus Colleges. The Postmastership is of the annual value of 80*l.*, and is tenable for five years from election, provided that the holder does not accept or retain any appointment incompatible with the pursuance of the full course of University studies. After two years' residence the College may raise, by a sum not exceeding 20*l.* per annum, the Postmastership of such Postmasters as shall be recommended by the Tutors for their character, industry, and ability.

Candidates for the Postmastership, if members of the University, must not have exceeded six terms of University standing, but there is no limit of age.

MR. J. PERRY, M.E., has been elected to the Chair of Mechanical Engineering at the City and Guilds Technical College, Finsbury, at the open election this week.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, March 30.—"On the Movement of Gas in 'Vacuum Discharges.'" By William Spottiswoode, F.R.S., and J. Fletcher Moulton, F.R.S.

In the preparation of tubes for our experiments, it was often noticed, that after the exhaustion had been carried to a certain degree, the passage of a strong current had the effect of increasing the pressure. This appeared to be due to an expulsion of gas from the terminals themselves by the passage of the discharge. And accordingly the use of such currents from time to time during the process of exhaustion was adopted for making the vacuum more perfect and more permanent than otherwise would have been the case. On the other hand, it was also noticed, that after the tube had been taken off the pump and sealed in the usual way, the passage of a strong current had in some instances the effect of decreasing the pressure. We thus met with two effects, apparently due to the same cause, but diametrically opposite in character.

Matters remained in this rather confused state, until we observed, with more care than before, a tube of which the exhaustion was near the phosphorescent state, and of which both terminals were metallic cones, and consequently presented large surfaces for any action which might take place upon them.

In what may be considered to have been its normal condition, this tube showed three or four large white striæ with a dark space of considerable size round the negative terminal. On passing the discharge through the tube for some minutes, the dark space increased, the striæ became fewer and feebler in illumination, the green phosphorescence began to show itself, and the discharge showed the usual signs of reduced pressure. On suddenly reversing the current, the striæ became again more numerous and more brightly illuminated, precisely as they would be by an increase of pressure, while the other features of the discharge in a great measure resumed their original character.

The most probable explanation of these phenomena appears to be this, that the effect of the discharge is actually to alter the pressure in the tube, not by any modification in the chemical composition of the gas, but simply by driving occluded gas out of one terminal, and by drawing it in, or occluding it, at the other. On reversing the discharge, the operation is reversed, and the occluded contents of one terminal are thrown along the tube to be occluded at the other. This view of the mechanism whereby the observed phenomena are produced is supported by the absence of these appearances when the terminals are comparatively small and the pressure is such that the occluded contents of the metallic mass forming one terminal would form only a small fraction of the total mass of gas in the tube; for in that case the pressure, and consequently the appearance of the discharge, would be affected only in an inappreciable degree by the injection of the contents of the terminal. It should also be added that, when the terminals are of unequal size, the effects are unequal, as might have been expected.

The phenomena in question appears to have so important a bearing on the mechanism of the discharge itself that it becomes a question of great interest to determine whether the missing gas is to be found in either of the terminals; and, if so, whether the ejection takes place at the positive, and the occlusion at the negative terminal, or *vice versâ*. For this purpose, I have devised a tube with three terminals, but have not yet had time to complete its construction or to make the experiment.

Zoological Society, April 4.—Prof. W. H. Flower, LL.D., F.R.S., president, in the chair.—Mr. Sclater exhibited and made remarks on an example of a rare Flycatcher (*Cyanomyias cœlestis*) from the Philippines, which had been sent to England for determination by Dr. Moesch of Zurich.—Mr. Sclater also exhibited and made remarks on two specimens of the Subcylindrical Hornbill (*Buceros subcylindricus*), which had been formerly living in the Society's Gardens.—Dr. A. Günther read the description of a new species of freshwater Turtle from Siam, a specimen of which had been recently acquired by the British Museum. The author proposed to name it *Geoemyda impressa*, from the peculiar shape of the principal upper plates, which are not merely flattened, but distinctly concave.—Mr. W. A. Forbes read a paper on the structure of the convoluted trachea of two species of Manucode (*Manucodia atra* and *Phonygama gouldi*), and added remarks on similar conformations in the tracheæ of other birds.—Mr. J. E. Harting read a paper on the eggs of three species of wading-birds which had been obtained by the Rev. W. Deans Cowan in the neighbourhood of Fianarantosa in the Betsileo country, Madagascar. The species to which these eggs belonged were *Glareola ocularis*, *Ægialitis geoffroyi*, and *Gallinago macrodactyla*. Much interest attached to these eggs, as not having been previously described.—A communication was read from Mr. E. P. Ramsay, C.M.Z.S., containing the description of a supposed new species of *Tephras*, an example of which had been obtained by the late Mr. S. White while collecting at the Aru Islands. The author proposed to name it *Tephras whitei*, after its discoverer.